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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/830,514	04/27/2001	Jurgen Rabenhorst	3968.057	8206

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PENDORF & CUTLIFF
5111 MEMORIAL HIGHWAY
TAMPA, FL 33634-7356

EXAMINER	
RAMIREZ, DELIA M	

ART UNIT	PAPER NUMBER
1652	

DATE MAILED: 11/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/830,514	RABENHORST ET AL.	
	Examiner	Art Unit	
	Delia M. Ramirez	1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 September 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *17 and 19-31* is/are pending in the application.

4a) Of the above claim(s) *24-28* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *17,19-23 and 29-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *4/27/2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4/27/01*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Status of the Application

Claims 17, 19-31 are pending.

Applicant's amendment of claims 17, 30 and cancellation of claim 18, in a communication filed on 9/2/2004 is acknowledged.

Applicant's election with traverse of Group I, claims 17-23 and 29-31, drawn to (a) an organism comprising enzymes of eugenol and/or ferulic acid metabolism which are inactivated such that the intermediates coniferyl alcohol, coniferyl aldehyde, ferulic acid, vanillin and/or vanillic acid accumulate, (b) a method of use of the organism of (a) in the preparation of alcohols, aldehydes, and organic acids, and (c) a method of making the organism of (a), in a communication filed on 9/2/2004 is acknowledged.

Applicant's traverse is on the ground(s) that the instant invention in its current form possesses a single general inventive concept under PCT Rule 13.1 because it possesses a special technical feature under PCT Rule 13.2 that is novel and has an inventive step. In particular, Applicants submit that neither Priefert et al. nor Gasson et al. teach accumulation of coniferyl alcohol, coniferyl aldehyde, ferulic acid, vanillin or vanillic acid. According to Applicants, Priefert et al. teaches chemical mutagenesis to produce a Pseudomonas strain having an inactivated vanillin dehydrogenase gene, while Gasson et al. teaches chemical mutagenesis to produce a Pseudomonas strain that cannot produce vanillin. Applicants submit that chemical mutagenesis does not produce deletions and indicate that neither of the references cited teaches inactivation by deletion or by insertion of Ω elements as recited in claim17.

Applicant's arguments have been fully considered but are not deemed persuasive to withdraw the restriction requirement previously applied. While it is agreed that both references teach chemical mutagenesis, and therefore deletions are not introduced, it is noted that as indicated previously, there is no unity of invention among Groups II-XIX since the members of the Markush group recited are not regarded as being of similar nature because all the alternatives do not share a common structure or

function. In addition, it is noted that according to PCT Rule 13.2, unity of invention exists only when there is a shared same or corresponding special technical feature among the claimed inventions. Each of the groups has a special technical feature not shared by the remaining groups. The special technical feature of Group I, as indicated previously, is an organism comprising enzymes of eugenol and/or ferulic acid metabolism which are inactivated such that the intermediates coniferyl alcohol, coniferyl aldehyde, ferulic acid, vanillin and/or vanillic acid accumulate, not shared by the remaining groups. The special technical feature of Groups II-XIX is a nucleic acid comprising SEQ ID NO: 1-18, respectively. Therefore, the claims are not so linked by a special technical feature within the meaning of PCT Rule 13.2 so as to form a single general inventive concept.

The requirement is deemed proper and therefore is made FINAL.

Claims 24-28 are withdrawn from further consideration by the Examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Specification

1. The specification is objected to as it does not follow the preferred layout for the specification of a utility application. As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order as appropriate. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.
(b) CROSS-REFERENCE TO RELATED APPLICATIONS.
(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
(d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables

having more than 50 pages of text are permitted to be submitted on compact discs.) or
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
(e) BACKGROUND OF THE INVENTION.
(1) Field of the Invention.
(2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
(f) BRIEF SUMMARY OF THE INVENTION.
(g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
(h) DETAILED DESCRIPTION OF THE INVENTION.
(i) CLAIM OR CLAIMS (commencing on a separate sheet).
(j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
(k) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

It is also noted that while some sections are present in the specification, there is no Brief Description of the Drawings section. Appropriate correction is required.

2. The specification is objected to due to minor typographical errors. In particular, the term "struktures" in page 32, line 9. While the Examiner has attempted to review the specification for additional typographical errors, Applicant's cooperation is requested in making corrections when necessary. Appropriate correction is required.

Priority

3. Acknowledgment is made of a claim for foreign priority under 35 U.S.C. 119(a)-(d) to GERMANY 198 50 242.7 filed on 10/31/1998.

4. This application is the US national stage of PCT/EP99/07952 filed on 10/20/1999.

Information Disclosure Statement

5. The information disclosure statement (IDS) submitted on 4/27/2001 is acknowledged. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

6. The drawings are objected to for the following reasons. While the specification in page 33 refers to Figures 2a-2r, figures labeled 2a-2r cannot be found in the specification. If these figures correspond to pages 52-75, which are labeled "Sequence #", these figures should be labeled accordingly. It is noted that in order to comply sequence rules, if the drawings depict sequences, the corresponding sequence identifier should be placed in the drawing or in the Brief Description of the Drawings. Appropriate correction is required.

Claim Objections

7. Claims 17, 19-20 and 29-31 are objected to due to the recitation of "transformed.....organism", "organism according ....", and "process for...". To be consistent with commonly used claim language, it is suggested that claims 17 and 29 be amended to recite "A transformed...organisms" and "A process for...", respectively. It is also suggested that claims 19-20 be amended to recite "The organism according to claim ...", and claims 30-31 be amended to recite "The process for....according to claim...". Appropriate correction is required.

8. Claims 21-23 are objected to due to the recitation of "an organism according to claim X.." Since the organism has been defined in a previous claim, it is suggested that the term be amended to recite "The organism according to claim X", or similar. Appropriate correction is required.

9. Claim 19 is objected to due to the recitation of "one or more genes encoding the enzymes.....is/are altered". For clarity, it is suggested that that term be amended to recite "one or more genes encoding the enzymes.....are altered..". Appropriate correction is required.

10. Claim 21 is objected to due to the recitation of "group consisting of a microorganism, a plant or animal cell". For clarity, it is suggested that the term be amended to recite "group consisting of a microorganism, a plant cell, or an animal cell". Appropriate correction is required.

Claim Rejections - 35 USC § 112, Second Paragraph

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claims 29-31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

13. Claim 29 is indefinite in the recitation of "preparation of alcohols, aldehydes, and organic acids comprising the step of adding an organism comprising enzymes.....such that the intermediates ...accumulate" for the following reasons. While the preamble indicates that the claimed process is directed to the production of any alcohol, aldehyde and organic acid, there is no step indicating how the intermediates accumulated are transformed into any alcohol, aldehyde or organic acid. For examination purposes, it will be assumed that claim is directed to a process for the preparation of coniferyl alcohol, coniferyl aldehyde, ferulic acid, vanillin and/or vanillic acid. Correction is required.

14. Claim 30 is indefinite in the recitation of "wherein the alteration in eugenol ...metabolism is achieved by microbiological culturing methods" for the following reasons. While claim 17, from which claim 29 depends, indicates that eugenol and/or ferulic acid metabolism is altered by inserting Ω elements or deletions in a gene, it is unclear as to which microbiological culturing methods would allow one of skill in the art to insert Ω elements or deletions in a gene. For examination purposes, no patentable

weight will be given to the term and the claim will be interpreted as being drawn to a method for preparing the organism of claim 17. Correction is required.

15. Claim 31 is indefinite in the recitation of "process for preparing an organism according to claim 29" since claim 29 is directed to a process for the preparation of alcohols, aldehydes, and organic acids. For examination purposes, it will be assumed that the claim recites "process for preparing the organism of claim 17". Correction is required.

16. Claims 30-31 are indefinite for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The claims are directed to a process of making the organisms of claim 17, however there are no steps indicating as to how the organism is made. Correction is required.

Claim Rejections - 35 USC § 112, First Paragraph

17. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

18. Claims 17, 19-23, 29-31 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 17 and 19 are directed to a genus of unicellular or multicellular organisms modified such that any enzyme associated in eugenol and/or ferulic acid catabolism is inactivated by inserting Ω elements or deletions in the genes encoding said enzymes, and wherein the intermediates coniferyl alcohol, coniferyl aldehyde, ferulic acid, vanillin and/or vanillic acid accumulate. Claims 20-23 are directed to the genus of organisms of claim 17 with the added limitation that the organisms are

unicellular. Claim 29 as interpreted is directed to a process of preparing coniferyl alcohol, coniferyl aldehyde, ferulic acid, vanillin and/or vanillic acid with a genus of unicellular or multicellular organisms modified such that any enzyme associated in eugenol and/or ferulic acid catabolism is inactivated by any means. Claims 30-31 are directed to a method of making the genus of unicellular or multicellular organisms of claim 17. While the specification discloses the mutagenesis of Pseudomonas sp. HR199 such that Ω elements are inserted in the Pseudomonas sp. HR199 genes encoding coniferyl alcohol dehydrogenase (calA), coniferyl aldehyde dehydrogenase (calB), feruloyl-CoA synthase (fcs), enoyl-CoA hydratase-aldolase (ech), vanillin dehydrogenase (vdh), and beta-ketothiolase (aat), the specification fails to describe (1) transgenic animals and plants (multicellular organisms) which have been modified such that their endogenous eugenol/ferulic acid catabolism associated genes have been inactivated by insertion of Ω elements or deletions, (2) the structures of all genes from any source (i.e. unicellular or multicellular organism) encoding enzymes associated with eugenol/ferulic acid catabolism which if inactivated would create an accumulation of coniferyl alcohol, coniferyl aldehyde, ferulic acid, vanillin and/or vanillic acid, and (3) methods to inactivate any enzyme associated with eugenol/ferulic acid catabolism (as required in claim 29), such as addition of inhibitors.

In regard to claims which require the inactivation of genes encoding enzymes associated with eugenol/ferulic acid catabolism, it is noted that the genus of genes which would have to be inactivated to obtain the genus of organisms claimed is extremely large and highly variable in structure. While a sufficient written description of a genus of genes may be achieved by a recitation of a representative number of polynucleotides defined by their nucleotide sequence or a recitation of structural features common to members of the genus, which features constitute a substantial portion of the genus, in the instant case, there is no structural feature which is representative of all the members of the genus of genes recited in the claim. Furthermore, while one could argue that the recited genus of genes is adequately described by the Pseudomonas sp. HR199 genes disclosed in the specification since one could use

structural homology using the structures of those genes disclosed in the specification and those known in the art to isolate genes encoding enzymes of similar function, it is noted that the art teaches the unpredictability of using structural homology to accurately determine function and even a high degree of structural homology may not result in functional homology. Witkowski et al. (Biochemistry 38:11643-11650, 1999) teaches that one amino acid substitution transforms a β-ketoacyl synthase into a malonyl decarboxylase and completely eliminates β-ketoacyl synthase activity. Seffernick et al. (J. Bacteriol. 183(8):2405-2410, 2001) teaches that two naturally occurring Pseudomonas enzymes having 98% amino acid sequence identity catalyze two different reactions: deamination and dehalogenation, therefore having different function. Broun et al. (Science 282:1315-1317, 1998) teaches that as few as four amino acid substitutions can convert an oleate 12-desaturase into a hydrolase and as few as six amino acid substitutions can transform a hydrolase to a desaturase. Therefore, in the absence of any additional information correlating structure with the desired enzymatic function, or any correlation between the structures of the Pseudomonas sp. HR199 genes disclosed and the desired function, many structurally unrelated genes are encompassed by the genus.

The specification only discloses a single species of the claimed organisms, Pseudomonas sp. HR199 mutagenized such that the endogenous genes encoding coniferyl alcohol dehydrogenase (calA), coniferyl aldehyde dehydrogenase (calB), feruloyl-CoA synthase (fcs), enoyl-CoA hydratase-aldolase (ech), vanillin dehydrogenase (vdh), and beta-ketothiolase are inactivated by Ω element insertion or gene deletion, and one method to obtain inactivation of an enzyme, i.e. Ω element insertion or gene deletion, which is insufficient to put one of ordinary skill in the art in possession of all attributes and features of the claimed invention. Therefore, one skilled in the art cannot reasonably conclude that the applicant had possession of the claimed invention at the time the instant application was filed.

19. Claims 17, 19-23, 29-31 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for (1) a transformed Pseudomonas sp. HR199 as described in the specification, wherein said strain contains at least one inactivated gene encoding coniferyl alcohol dehydrogenase (calA), coniferyl aldehyde dehydrogenase (calB), feruloyl-CoA synthase (fcs), enoyl-CoA hydratase-aldolase (ech), vanillin dehydrogenase (vdh), or beta-ketothiolase (aat), wherein said gene inactivation is due to the introduction of deletions or insertional mutagenesis with Ω elements, (2) a method of using said Pseudomonas strain for the production of coniferyl alcohol, coniferyl aldehyde, ferulic acid, vanillin and/or vanillic acid, and (3) a method of making the strain of (1), does not reasonably provide enablement for (a) any unicellular or multicellular organism modified such that any enzyme associated with eugenol and/or ferulic acid catabolism is inactivated by inserting Ω elements or deletions in the genes encoding said enzymes, and wherein the intermediates coniferyl alcohol, coniferyl aldehyde, ferulic acid, vanillin and/or vanillic acid accumulate, (b) any unicellular or multicellular organism modified such that any gene encoding coniferyl alcohol dehydrogenase, coniferyl aldehyde dehydrogenase, feruloyl-CoA synthase, enoyl-CoA hydratase-aldolase, vanillin dehydrogenase, or beta-ketothiolase is inactivated by insertion of Ω elements or deletions, (c) a method to produce coniferyl alcohol, coniferyl aldehyde, ferulic acid, vanillin and/or vanillic acid with the organisms of (a) or (b), or (d) a method of making the organisms of (a) or (b). The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

The criteria for undue experimentation, summarized in *re Wands*, 8, USPQ2nd 1400 (Fed. Cir. 1988) are: 1) quantity of experimentation necessary, 2) the amount of direction or guidance presented, 3) the presence and absence of working examples, 4) the nature of the invention, 5) the state of prior art, 6) the relative skill of those in the art, 7) the predictability or unpredictability of the art, and 8) the breath of the claims.

The scope of the claims as described above is not commensurate with the enablement provided in regard to the extremely large number of unknown unicellular and multicellular organisms which can be modified as recited in the claims such that accumulation of coniferyl alcohol, coniferyl aldehyde, ferulic acid, vanillin and/or vanillic acid is achieved, as well as the extremely large number of genes of unknown structure which are required for inactivation. As discussed previously, the specification discloses the mutagenesis of Pseudomonas sp. HR199 with the insertion of Ω elements in the Pseudomonas sp. HR199 calA, calB, fcs, ech, vdh, and aat genes. However, the specification is completely silent in regard to (1) multicellular organisms, such as transgenic animals and plants, which have been modified such that their endogenous eugenol/ferulic acid catabolism associated genes have been inactivated by insertion of Ω elements or deletions, (2) the structures of all genes from any source (i.e. unicellular or multicellular organism) encoding enzymes associated with eugenol/ferulic acid catabolism which if inactivated would create an accumulation of coniferyl alcohol, coniferyl aldehyde, ferulic acid, vanillin and/or vanillic acid, and (3) methods to inactivate any enzyme associated with eugenol/ferulic acid catabolism, as required in claim 29, such as addition of inhibitors.

The art as previously discussed clearly teaches the unpredictability of the art in regard to accurate determination of function based solely on structural homology. See the teachings of Witkowski et al., Broun et al. and Seffernick et al. already discussed. Since structure determines function, one of skill in the art would require some knowledge or guidance as to which are the structural elements in any gene which are characteristic of genes encoding enzymes associated with eugenol and/or ferulic acid catabolism. Therefore, due to the lack of relevant examples, the amount of information provided, the lack of knowledge about the structural elements required encode an enzyme associated with eugenol and/or ferulic acid catabolism, and the unpredictability of the prior art in regard to function based on homology, one of ordinary skill in the art would have to go through the burden of undue experimentation in order to practice the claimed invention. Thus, Applicant has not provided sufficient guidance to enable

one of ordinary skill in the art to make and use the invention in a manner reasonably correlated with the scope of the claims.

20. It is noted that if the claims were to be amended to refer specifically to Pseudomonas sp. HR199, a biological deposit may be required to satisfy the enablement requirements set forth in 35 USC 112, first paragraph.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

21. Claim 29 is rejected under 35 U.S.C. 102(b) as being anticipated by Priefert et al. (J. Bacteriol. 179(8):2592-2607, 1997; previously cited by the Examiner). Claim 29 as interpreted is directed to a process for the production of coniferyl alcohol, coniferyl aldehyde, ferulic acid, vanillin and/or vanillinic acid wherein an organism is modified such that enzymes involved in the catabolism of eugenol and/or ferulic acid are inactivated. Priefert et al. teaches the chemical mutagenesis of Pseudomonas sp. HR 199 wherein the vdh gene is inactivated (page 2595; Abstract; Materials and Methods). The vdh gene encodes vanillin dehydrogenase which catalyzes the formation of vanillic acid (Figure 1, page 2596). Inactivation of this enzyme would allow for the accumulation of vanillin since vanillic acid cannot be formed. Therefore, the teachings of Priefert et al. anticipate the instant claim as written.

Claim Rejections - 35 USC § 103

22. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

23. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

24. Claims 17, 19-23, 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Priefert et al. (J. Bacteriol. 179(8):2592-2607, 1997; previously cited by the Examiner) in view of Blondelet-Rouault et al. (Gene 190:315-317, 1997). The teachings of Priefert et al. have been discussed above. Priefert et al. does not teach inactivation of the vdh gene by insertion of Ω elements or by introducing deletions. Blondelet-Rouault et al. teaches antibiotic resistance gene cassettes which contain Ω elements to allow for insertional mutagenesis (Abstract, page 315). Blondelet-Rouault et al. does not teach a Pseudomonas strain which has been mutagenized to inactivate the vdh gene.

Claims 17, 19-23 are directed in part to a transformed and/or mutagenized Pseudomonas strain wherein one or more genes encoding coniferyl alcohol dehydrogenases, coniferyl aldehyde dehydrogenases, feruloyl-CoA synthetases, enoyl-CoA hydratase-aldolases, beta-ketothiolases, vanillin dehydrogenases or vanillic acid demethylases are inactivated. Claims 30-31, as interpreted, are directed to a method for preparing the transformed and/or mutagenized Pseudomonas strain of claim 17.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the antibiotic resistance gene cassettes of Blondelet-Rouault et al. for insertional mutagenesis of the vdh gene in the Pseudomonas strain of Priefert et al. A person of ordinary skill in the art is motivated to

use the antibiotic resistance gene cassettes of Blondelet-Rouault et al. for insertional mutagenesis of the vdh gene in the Pseudomonas strain of Priefert et al. for the benefit of being able to select those mutants which have the inactivated vdh gene using antibiotic-containing medium. One of ordinary skill in the art has a reasonable expectation of success at using insertional mutagenesis to disrupt the vdh gene in Pseudomonas with the antibiotic resistance gene cassettes of Blondelet-Rouault et al. since Ω elements (Ω interposon) for insertion mutagenesis in bacteria is well known and widely used in the art (page 315, right column, first paragraph). Therefore, the invention as a whole would have been prima facie obvious to a person of ordinary skill in the art at the time the invention was made.

Conclusion

25. No claim is in condition for allowance.

26. Certain papers related to this application may be submitted to Art Unit 1652 by facsimile transmission. The FAX number is (703) 872-9306. The faxing of such papers must conform with the notices published in the Official Gazette, 1156 OG 61 (November 16, 1993) and 1157 OG 94 (December 28, 1993) (see 37 CFR 1.6(d)). NOTE: If Applicant submits a paper by FAX, the original copy should be retained by Applicant or Applicant's representative. NO DUPLICATE COPIES SHOULD BE SUBMITTED, so as to avoid the processing of duplicate papers in the Office.

27. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PMR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

28. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Delia M. Ramirez whose telephone number is (571) 272-0938. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Ponnathapura Achutamurthy can be reached on (571) 272-0928. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1234.

Delia M. Ramirez, Ph.D.
Patent Examiner
Art Unit 1652

DR
October 26, 2004

REBECCA E. PROUTY
PRIMARY EXAMINER
GROUP ~~1800~~ 1600